

REMARKS

After entry of the foregoing amendment, claims 1-12 are pending in the application.

The allowance of claims 1-8 is acknowledged with appreciation.

In accordance with the drawing requirement, two sheets of corrected drawings are submitted herewith.

The specification has been amended to provide better antecedent basis for the subject matter of claims 9-11. In particular, the text of these claims has been rewritten into narrative form, and inserted on page 7.

Applicants respectfully traverse the assertion that the subject matter of claims 9-11 is not supported in the priority application. In particular, the Action stated that the provisional application failed to include any mention or description of:

- setting the polarities of the components of a grid signal in accordance with payload data to be represented thereby (claim 9); and
- that such payload data serve to convey protocol information (claim 11).

The priority application stated:<sup>1</sup>

An exemplary grid signal is one with the following characteristics:

1. It comprises a collection of impulse or delta functions in the Fourier magnitude domain.
2. The impulse functions have pseudo random phase (i.e. the phase is random, yet known so that translation (its X and Y origin) of the watermark can be computed by correlating the phase information of the calibration signal with the watermarked signal)
3. The impulse functions are typically distributed in the mid-frequency range so as to survive distortion yet not be perceptible

In accordance with another aspect of the invention, the impulse functions can be modulated to carry auxiliary information as follows:

Encode:

- a. create message (e.g., binary bit string)
- b. error correction encode and/or spread spectrum modulate the string
- c. map elements of resulting message signal to fourier magnitude impulse function locations
- d. encode 1 as positive impulse function and encode 0 as negative impulse function (or other predetermined relation)

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<sup>1</sup> Text bridging pp. 4-5.

Thus, this excerpt teaches that the grid signal can carry auxiliary information, with, *e.g.*, “1”s in the auxiliary data represented by positive impulse functions, and “0”s represented by negative impulse functions.

Seven lines later, the provisional application also stated:

Note that there are many possible applications: The calibration signal can carry protocol information to tell the decoder how to interpret the message payload of another watermark signal.

Thus, this excerpt teaches that this grid (*i.e.*, calibration<sup>2</sup>) signal can serve to convey protocol information.

Claim 9 is an encoding method that stands rejected over Kalker (6,577,747) in view of Op De Beeck (6,671,388).

As understood, Kalker does not teach or suggest the claim limitation of “defining a grid signal ... in the Fourier domain.”

Kalker’s Fig. 4 is cited in the Action in support of this limitation. However, Fig. 4 illustrates Kalker’s decoder. His encoder, in contrast, is shown in Fig. 1. His encoder appears to simply sum the (pixel domain) image frame data with (pixel domain) watermark data. No definition of a signal in the Fourier domain is taught, as required by claim 9.

Nor does Op De Beeck cure this deficiency.

In view of this shortcoming, other points that might be raised regarding claims 9-11 are not belabored. Reconsideration is requested.

(To avoid any implication that the grid signal of claim 9 requires a regular, matrix-like, aspect, this term has been replaced by the term “calibration.” Support for this equivalence is found, *e.g.*, at page 1, lines 16-20. Nor surrendering or narrowing of claim scope, or equivalency, is intended.)

Claim 12 has been newly added, and specifies that the cited components of the grid signal comprise impulse or delta functions in the Fourier magnitude domain.

<sup>2</sup>

The first sentence of the provisional application notes:

Steganographic **calibration signals** (sometimes termed “orientation signals,” “marker signals,” reference signals,” “**grid signals**,” etc.) are sometimes included with digital watermarking signals so that subsequent distortion of the object thereby marked (*e.g.*, a digital image file, audio clip, document, etc.) can later be discerned and compensated-for.

(Emphasis added.)

In view of the foregoing, claims 1-12 are believed to be in condition for allowance, and action to that end is solicited.

Date: May 10, 2005

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Respectfully submitted,

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